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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|----------------------|------------------|
| 09/125,128 | 08/11/1998 | YUICHIRO IGUCHI | 1084-98 | 7453 |
| 35811 | 7590 | 09/14/2004 | EXAMINER | |
| IP DEPARTMENT OF PIPER RUDNICK LLP ONE LIBERTY PLACE, SUITE 4900 1650 MARKET ST PHILADELPHIA, PA 19103 | | | CLEVELAND, MICHAEL B | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1762 | |

DATE MAILED: 09/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|--------------------------------------|--|
| Office Action Summary | Application No. 09/125,128 | Applicant(s) IGUCHI ET AL. | |
| | Examiner Michael Cleveland | Art Unit 1762 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,33,58 and 61-120 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 33, 58, 61-120 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claim 71 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 69-70, 75-78, 81-86, 89, 104-105, 109, 111, 113, and 117-120 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification has support for limitations to “phosphor pastes” but does not support the broader limitation of “fluorescent pastes” as claimed in claims 69-70, 75-78, 81-86, 89, 104-105, 109, 111, 113.

There is no support for the limitation that “the paste only flows from each individual hole into a corresponding space between adjacent ribs” because there is no such language in the specification as originally filed. To the contrary, the specification and original claims 24-25 and 57 state that phosphor paste is deposited in locations other than the intended final phosphor locations.

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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5. Claims 69-70, 75, 77-78, 83-86, 89, 93-95, 101, 104, 111, 115-116 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 69, 75, 77-78, 83-86, 89, 111, 113: The phrase “said fluorescent pastes” and analogous language lacks antecedent basis in the parent claim(s).

Claim 70: The phrase “pastes respectively containing a fluorescent material different in color ... or more.” is unclear because it refers to a single nozzle but multiple outlet holes, and it is not clear how the different pastes relate to the outlet holes.

Claims 93-95, 101, 115-116: Apparatus claims must depend only on the characteristics of the apparatus and not on the intended use of the apparatus. Thus, claims 93-95, 101, 115-116 are vague and indefinite because, if the claims were granted, infringement would necessarily be determined in part by the features of the substrate and/or intended use of the apparatus.

Claim 104: The scope of the final clause “... and the holes corresponding...according to a predetermined order.” is not clear to the Examiner. How are the holes “arranged cyclically”? As far as the Examiner understands the claim, it appears that if three adjacent nozzles of the form of ‘836 Figs. 15 and 16 were used simultaneously to provide all of the coating stripes, that the resulting staggered nozzle formation would read on the limitation “arranged cyclically”. (See below.)

Claim 111 is grammatically unclear. The Examiner assumed that “wherein” should have been “further comprising” and recommends amending the claim accordingly.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 33 and 58 are rejected under 35 U.S.C. 102(b) as being anticipated by Norris et al. (U.S. Patent 5,556,665, hereafter ‘665).

‘665 teaches an apparatus for producing a display (col. 1, lines 5-9), comprising:

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a tubule (i.e., nozzle) deposition system having a multiplicity of outlet holes (col. 2, lines 29-40 of average diameter of, for instance, 20 microns (col. 3, lines 11-12), for at least one color of red, green, or blue (col. 2, lines 46-52) to face a plurality of spaced apart barrier ribs located on a substrate (The ribs may be deposited by tubules immediately ahead of the phosphors or preformed on the substrate (col. 2, lines 29-40).), wherein a phosphor suspension (i.e., paste) (col. 2, lines 47-49) supply is operatively connected to the nozzle deposition system (col. 2, lines 60-65) supply paste to the substrate from all of the holes for the colors at the same time (See Fig. 6e and col. 3, lines 46-60), and a means for moving the substrate and the nozzle deposition system relative to each other (col. 3, lines 46-60).

Claim 58: The device may comprise three separate manifolds (i.e. coating devices) 33, 35, and 37 for the three colors (col. 2, lines 60-65).

Claims 33 and 58: '665 does not explicitly teach using the apparatus to form a plasma display, but a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. See *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963). The apparatus of '665 is capable of depositing red, green, and blue pastes for a plasma display instead of for a cathode ray tube display.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1-2, 33, and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norris '665 in view of Miyake et al. (U.S. Patent 5,136,207, hereafter '207).

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‘665 teaches a method for producing a video display (col. 1, lines 5-9), comprising: applying, in stripes between barrier ribs (which may be deposited by tubules immediately ahead of the phosphors or preformed on the substrate (col. 2, lines 29-40)), a phosphor suspension (i.e., paste) (col. 2, lines 47-49) containing a phosphor powder (col. 3, lines 12-14) onto a substrate having a plurality of the barrier ribs formed thereon (col. 2, lines 29-39) from a multiplicity of tubules (i.e., outlet holes of a nozzle deposition system) (col. 2, lines 29-40) of average diameter of, for instance, 20 microns (col. 3, lines 11-12), for at least one color of red, green, or blue (col. 2, lines 46-52) such that the paste flows to the substrate from all of the holes for the colors at the same time (See Fig. 6e and col. 3, lines 46-60) and between the barrier ribs (Fig. 1).

‘665 does not explicitly teach that the display is a plasma display nor that the phosphor suspension contains an organic compound.

However, the Examiner takes Official Notice that plasma displays are notoriously well known video displays that use red, green, and blue phosphor stripes between barrier ribs. See for instance, ‘207, col. 1, lines 5-12, col. 6, lines 41-60, and Figs. 7-8. The selection of something based on its known suitability for its intended use has been held to support a *prima facie* case of obviousness. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). See MPEP 2144.07. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the method of ‘665 to have deposited the red, green, and blue phosphors of a plasma display as the particular type of video display because plasma display are well known in the art as suitable display panels that use red, green, and blue phosphor stripes between barrier ribs.

Also, ‘207 teaches that operative phosphor pastes may contain organic binders and/or solvents (col. 4, lines 49-55). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an organic solvent or binder in the suspension of ‘665 because ‘207 teaches that organic binders and solvents are operative carriers for depositing phosphor pastes.

Claim 2: ‘665 does not explicitly teach heating the panel. ‘207 teaches that heating the panel after coating with a phosphor paste improves the luminance of the phosphors (col. 4, lines 36-40). Therefore, it would have been obvious to one of ordinary skill in the art at the time the

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invention was made to have heated the substrate of '665 and '207 after deposition because '207 teaches that such heating improves the luminance of the phosphor compositions.

Claim 58: The device may comprise three separate manifolds (i.e. coating devices) 33, 35, and 37 for the three colors (col. 2, lines 60-65).

Claims 33 and 58: '665 does not explicitly teach using the apparatus to form a plasma display as discussed above, but '207 renders the use of the method to form a plasma display as the particular video display obvious, as discussed above regarding claim 1.

10. Claims 61-66, 68-74, 76, 78-79, 83-84, 87-88, 90-98, 100-101, 104-105, 107-112, and 114-116 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nanto et al. (U.S. Patent 5,921,836, hereafter '836).

'836 teaches a method of and apparatus for forming a plasma display panel using a paste applicator with a plurality of nozzles (and therefore a plurality of holes) at the same time (See Figs. 20-22) to deposit a phosphor paste including an organic binder to form a phosphor layer on a substrate with a plurality of barrier ribs (col. 4, lines 16-39). The phosphors may be of three colors (red, green, and blue), applied as stripes, and dried (col. 1, line 58-col. 2, line 12). The dried films coat the substrate, anode, and sides of the barrier ribs. See, for instance, Fig. 1.

'836 suggests using a substrate with a hole diameter of 100 microns (col. 4, lines 36-39).

'836 does not explicitly teach an outlet hole pitch of 0.12 to 3 mm nor the use of 150-2000 outlet holes. However, it does teach that the outlet hole pitch is determined by the rib pitch (col. 11, lines 41-59). '836 suggests a spacing (S) between barrier ribs of 170 microns (col. 4, lines 36-39) and a rib width (W) of 50 microns (col. 8, lines 1-12), thereby suggesting a rib pitch ($P=S+W$) of 220 microns. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have use a hole pitch of about 220 microns (0.22 mm) as the particular hole pitch because '836 teaches that the hole pitch should be the same as the rib pitch. '836 explicitly teaches that there may be 5-30 nozzles (col. 4, lines 26-39). However, given that there are many stripes to be formed (see, e.g., col. 8, lines 1-2), it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used more nozzles in order to have decreased processing time. '836 that there may be 1920 grooves (col. 8, lines 1-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an applicator with up to 1920 holes in order to have coated the substrate in a single pass in order to have decreased processing time. Alternatively, for a

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multicolor device, there are up to 640 grooves of each color (col. 8, lines 9-12), suggesting the use of 640 nozzles at a pitch of 0.64 mm.

Claims 63, 90, 93, 100, 115: '836 suggests using a substrate with a spacing S of 170 microns and D of 100 microns (col. 4, lines 36-39).

Claim 64: The applicator holes may be formed as nozzles (col. 4, lines 26-39).

Claim 65 and 98: '836 explicitly teaches that there may be 5-30 nozzles (col. 4, lines 26-39). However, given that there are many stripes to be formed (see, e.g., col. 8, lines 1-2), it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used more nozzles in order to have decreased processing time.

Claims 66 and 95: The hole pitch may be six times the barrier pitch (col. 11, lines 45-53).

Claim 68: '836 suggests a hole diameter of 100 microns (col. 4, lines 30-34).

Claim 69: The clearance (distance between the nozzle tips and barrier top) should be kept constant. Typical values are 0.1-0.2 mm (col. 6, lines 3-13).

Claims 70, 78, 83-84, and 87: '836 does not explicitly teach Applicant's claimed ranges of the outlet hole pitch, phosphor paste compositions or viscosities, barrier rib characteristics, and spacing between stripes. The resolution is affected by variables such as the distance between stripes of different colors, barrier height, width, and pitch. The viscosity of the paste is affected by the composition of the paste (col. 4, lines 16-20, col. 7, line 66-col. 8, line 19). The outlet hole pitch is determined by the rib pitch (col. 11, lines 41-59). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have optimized these characteristics for the desired resolution and paste thickness.

Claims 71-72: The pastes may be applied from more than one nozzle (56a) that travel together at the same speed.

Claim 73: Each color phosphor paste may be applied and then dried separately (col. 1, line 58-col. 2, line 12).

Claim 74: The substrate and nozzle may be moved parallel to each other (col. 4, lines 49-53).

Claim 76: '836 does not explicitly teach Applicant's claimed order of application. The coating process begins outside of the region of effective display (col. 6, lines 35-41), apparently so that nonuniformities during the beginning of the deposition are not seen in the final product. By extension, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have continued movement beyond the effective region at the end of each stripe as well to prevent nonuniformities at the end of the process. Thus, it would have been

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obvious to one of ordinary skill in the art at the time the invention was made to have begun moving the nozzle before deposition and stopped after deposition ceased in order to avoid nonuniformities in the effective region of the display panel.

Claim 79: The paste may contain ethyl cellulose (a binder resin) (col. 4, lines 16-20).

Claim 88: The top of the ribs may be colored black (col. 5, line 59-col. 6, line 2).

Claim 94: '836 suggests using a substrate with a spacing S of 170 microns and D of 100 microns (col. 4, lines 36-39). The shape of the holes is a design choice. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a non-circular nozzle with the expectation of similar results.

Claims 96-97: Figs. 15 and 16 suggest that the outlet holes are on the same plane and identical in form.

Claim 101: '836 teaches that the apparatus has sensors to detect the ribs and to adjust the substrate accordingly (col. 7, lines 8-32). Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to have positioned the nozzles above the centers of the grooves in order to evenly distribute the phosphor onto the barrier walls.

Claims 104 and 105: Figs. 16 and 22 suggest a distribution system in which one storage section is used to dispense paste to multiple nozzles. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used multiple nozzles to distribute the multiple phosphors simultaneously in order to reduce the processing times. In such an embodiment, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have three staggered sets of nozzles, each set with its own distribution system to supply different colored phosphors in order to reduce the processing time by applying all the stripes simultaneously.

Claim 107: The apparatus may have means to detect the position of the tips of the outlet holes and the tops of the barrier ribs (col. 6, lines 3-20) and controlling the area of application (col. 6, lines 3-50).

Claim 108: The distance between the ribs and nozzle tips is kept constant (col. 6, lines 3-14). The apparatus has means to adjust the inclination degree of the applicator nozzles (col. 12, lines 40-49).

Claim 109: The apparatus has means to detect the position of the phosphor paste (col. 7, lines 24-32).

Claim 110-111: The apparatus comprises means to recognize alignment marks that determine the positions of the ribs and grooves (i.e., spaces) so that the phosphor may be deposited in the grooves (col. 5, line 48-col. 6, line 2).

Claim 112: Clogging of the nozzles may occur (col. 9, lines 59-62). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included means to clean the nozzle to remove such clogs.

Claim 114: Multiple applicators may be provided to apply the phosphors in series (Fig. 13).

Claims 117-120: '836 does not indicate that the paste is deposited anywhere but within the grooves. (See, e.g., Fig. 18.)

11. Claims 67 and 99 are rejected under 35 U.S.C. 103(a) as being unpatentable over '836 as applied to claims 61 and 92 above, and further in view of Ravi-Chandar et al. (U.S. Patent 5,656,574, hereafter '574).

'836 does not describe the use of outlet holes with a length/diameter ratio of 0.1-600. The Examiner takes official notice that the length to diameter ratio of a nozzle for dispensing pastes is known to affect the rheological properties and therefore the dispensing efficiency of the nozzle. See, for instance, the extrusion process described in '574, col. 6, lines 40-49. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have optimized the length-to-diameter ratio of the paste applicator of '836 for the optimum rheological properties.

12. Claims 75 and 106 are rejected under 35 U.S.C. 103(a) as being unpatentable over '836 as applied to claims 61 and 92 and further in view of Mettenbrink (U.S. Patent 4,775,080, hereafter '080).

'836 is described above. '836 also teaches that the apparatus comprises pressure adjusting and controlling means to dispense the paste (col. 7, lines 48-54). '836 does not teach that the pressure may be designed to be negative. However, clogging of the nozzle is taught as disadvantageous (col. 9, lines 59-62). It is well known to prevent the formation of dried beads of material that clog nozzles by applying a vacuum to the nozzle when the dispensing stops. As an

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example, '080 teaches the operation of a toothpaste dispenser, in which a vacuum is formed in the nozzle that avoids the formation of a plug of hardened paste outside the nozzle (col. 8, lines 33-40). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have allowed the adjusting means of '836 to apply a negative pressure to draw undispensed material back into the nozzle at the end of dispensing in order to prevent clogging of the nozzles.

13. Claims 77 and 84 are rejected under 35 U.S.C. 103(a) as being unpatentable over '836 as applied to claim 61 above and further in view of Osaka '840.

'836 does not teach Applicant's specifically claimed ranges of the grain size, specific surface area, or paste viscosity.

'840 teaches that the particle size and viscosity of phosphor pastes are known to affect the light-emitting characteristics and resolution (col. 3, lines 8-39 and Abstract). The size distribution necessarily affects the specific surface area. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to have optimized the size distribution, specific surface area and paste viscosity of '553 for the best light-emitting characteristics and resolution.

14. Claim 80 is rejected under 35 U.S.C. 103(a) as being unpatentable over '836 as applied to claim 61 above and further in view of Igarashi et al. (U.S. Patent 4,792,723, hereafter '723).

'836 teaches the method of claim 61 as detailed above, but does not teach the use of terpineol as the solvent for the paste. However, terpineol is a conventional paste solvent for phosphor pastes. See, for instance, '723, col. 3, line 50-col. 4, line 6. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used terpineol as the solvent of '836 with the expectation of similar results.

15. Claims 85-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over '836 as applied to claim 61 above, and further in view of Yamaura et al. (U.S. Patent 4,680,231, hereafter '231).

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'836 does not teach the use of a photosensitive component in the phosphor paste. '231 teaches that phosphor pastes may include photosensitive components in order to perform further photolithographic processing. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a photosensitive component in the phosphor paste of '836 in order to make the process more flexible by allowing further patterning by photolithography (for example, to remove, undesired material from the tops of the barrier ribs) (Abstract, col. 6, line 42-col. 7, line 10).

16. Claims 89 and 113 are rejected under 35 U.S.C. 103(a) as being unpatentable over '836 as applied to claims 61 and 92 above, and further in view of Shinoda et al. (U.S. Patent 5,674,553, hereafter '553).

Claim 89: '836 is silent as to the phosphor layer thickness, and therefore does not teach the thickness of the coating on the bottom (T1) and the side wall (T2). However, '553 teaches that the thickness of the phosphor layer obtained after drying is a result-effective parameter and that there is a trade-off between brighter displays achieved by thicker layers and lower discharge initialization voltages necessary for thinner layers. '553 teaches that layers of 10-50 microns are preferred. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the method of '836 to have produced phosphor layer thicknesses of 10-50 microns. While there is no teaching regarding the ratio of the thickness of the layer on the bottom (T1) and the side wall (T2), any values independently chosen from the preferred range necessarily produce a ratio of $0.2 \leq T1/T2 \leq 5$.

Claim 113: '836 does not explicitly teach that the apparatus includes means to remove undesired deposits of phosphor paste. '553 explicitly teaches that phosphor is not desired on top of the barrier ribs of a plasma display panel (col. 12, lines 16-26). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have removed any phosphor accidentally deposited on top of the barrier ribs in the invention of '836.

17. Claims 81-82 and 85-86 are rejected under 35 U.S.C. 103(a) as being unpatentable over '836 as applied to claim 61 above and further in view of Shinoda '553, Yamaura '231, and Mizuno et al. (U.S. Patent 5,466,325, hereafter '325).

'836 is described above. It does not teach that phosphor deposited on top of the barrier ribs are removed by an adhesive material. However, '553 explicitly teaches that phosphor is not

desired on top of the barrier ribs of a plasma display panel (col. 12, lines 16-26). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have removed any phosphor accidentally deposited on top of the barrier ribs in the invention of '836. Further, '231 suggests the inclusion of a photosensitive material in a phosphor paste to allow photolithographic processing, as described above. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have used such a photolithographic process to have removed the undesired portions of the phosphor paste. In such a case, the phosphor paste acts like the photoresist of a conventional photolithographic process.

'325 teaches the patternwise removal of photoresist material from a substrate using a pressure-sensitive adhesive. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used an adhesive to remove the undesired portion of the phosphor paste in the embodiment suggested by '836, '553, and '231 with the expectation of similar results and with a reasonable expectation of success.

18. Claims 102-103 are rejected under 35 U.S.C. 103(a) as being unpatentable over '836 as applied to claim 92 above, and further in view of Silverbrook (U.S. Patent 5,850,241, hereafter '241).

'836 teaches the limitations of claim 92, but does not teach that the nozzle is coated with a fluorine-based resin or amorphous carbon film. '241 teaches that ink-jet nozzles may be coated with hydrophobic films such as an amorphous carbon film (col. 38, line 66-col. 39, line 30) to prevent reaction between the nozzle and polar solvent-based inks. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a hydrophobically coated nozzle in order to deposit the paste of '836 when the desired paste uses a polar solvent as a vehicle to prevent interactions between the paste and the nozzle. '241 teaches amorphous carbon and fluorinated diamond films. The Examiner takes official notice that fluororesins are notoriously well-known hydrophobic coatings. Thus it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a fluorinated resin as the hydrophobic coating material with the expectation of similar results.

19. Claims 117-120 are rejected under 35 U.S.C. 103(a) as being unpatentable over Norris '665 as applied to claims 1, 2, 33, and 58 above, and further in view of Shinoda '553.

'665 does not explicitly teach that the apparatus only deposits into the grooves between ribs. '553 explicitly teaches that phosphor is not desired on top of the barrier ribs of a plasma

display panel (col. 12, lines 16-26). Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have deposited the paste only in the area between the ribs because in order to have saved material and with a reasonable expectation of success because '553 teaches that phosphor is not desired on top of the barrier ribs of a plasma display panel.

Response to Arguments

20. Applicant's arguments filed 6/30/04 have been fully considered but they are not persuasive.

Applicant argues that Norris does not teach 150-2000 outlet holes. The argument is unconvincing because claims 1, 2, 33, and 58 do not claim 150-2000 outlet holes. However, such a limitation would not render the claims patentable over Norris because the selection of the number of holes would have been a design decision made based on balancing features such as increased speed of coating to the desired thickness (with a greater number of holes) and decreased capital and maintenance costs (with a lesser number of holes).

Applicant argues that Miyake cannot be combined with Norris because Miyake uses screen printing. The argument is unconvincing because the rejection is based on Official Notice, as stated in the prior rejection, that plasma displays are notoriously well known video displays that use red, green, and blue phosphor stripes between barrier ribs. Norris is merely cited to support the Official Notice. In accordance with MPEP 2144.03C, "[t]o adequately traverse such a finding, an applicant must specifically point out the supposed errors in the examiner's action, which would include stating why the noticed fact is not considered to be well-known or common in the art." Because Applicant has not seasonably challenged the citation of Official Notice, it is taken as admitted prior art that plasma displays are notoriously well known video displays that use red, green, and blue phosphor stripes between barrier ribs.

Conclusion

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

22. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael Cleveland whose telephone number is (571) 272-1418. The examiner can normally be reached on Tuesday-Friday and alternate Mon, 8-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shrive Beck can be reached on (571) 272-1415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Michael Cleveland
Examiner
Art Unit 1762

September 10, 2004